

## **INTELLIGENT POWER SOCKET**

### **FIELD OF THE INVENTION**

The present invention relates to an intelligent power socket, more particularly to a power socket that can turn off the power of the peripherals of an electric appliance when the power of such electric appliance is turned off.

### **BACKGROUND OF THE INVENTION**

In general, the power socket of a traditional extension cord comprises a base with a plurality of sockets, and such base is connected to a power supply by an external extension circuit, so that the circuit is connected to the power supply, and power can be supplied to each electric appliance connected to each socket. However, such device has only one master switch, and cannot turn off particular sockets, and thus causing unnecessary consumption of electric power.

To overcome the shortcomings of the foregoing traditional socket, a socket with control switches to individually control every socket is designed. Although such arrangement can reduce power consumption, it still requires the user to turn on or off each control switch for its application. Therefore, it is necessary to manually turn off the control switches of related electrical appliances connected to the power socket one by one. Now, we take the combination of television, tape-recorder, and speaker; the combination of stereo system and the stereo speaker; and the combination of computer system, monitor, and other peripherals for examples. When the power of the main electric appliance is turned off,

its related electric appliances connected to the power sockets must be turned off one by one manually by the control switch. Therefore, such arrangement is troublesome, and users may forget to turn on or off some of the control switches.

5 In view of the shortcomings of the traditional device described above, the inventor of this invention focused on its problems and started thinking for an improvement to overcome such shortcomings and find a feasible solution. After extensive research and development, the inventor finally invented and designed the intelligent power socket in accordance with this  
10 invention.

### **SUMMARY OF THE INVENTION**

The primary objective of the present invention is to provide an intelligent power socket, which comprises a first socket, a second socket; a compare amplify circuit, and a control circuit disposed between the first  
15 socket and the second socket, wherein the compare amplify circuit is mainly used to compare the voltage outputted from the first socket with a standard voltage, and the control circuit is used to compare the signal sent from the compare amplify circuit after the comparison and control the ON and OFF states of the power of the second socket. For example, when  
20 the power of an electric appliance is disconnected from the first socket, the compare amplify circuit will output a high potential signal to the control circuit, so that power will not be supplied to the second socket, and thus turning off the electric appliance connected to the second socket. This

invention not only saves power, but also turns off the power of the electric appliances connected to the second socket automatically as the power of the electric appliance connected to the first socket is turned off, and thus making the operation simple and easy.

5        To make it easier for our examiner to understand the objective of the invention, its structure, innovative features, and performance, we use a preferred embodiment together with the attached drawings for the detailed description of the invention.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

10       FIG. 1 is a perspective diagram of the disassembled parts of the structure according to a preferred embodiment of this invention.

FIG. 2 is a perspective diagram of the assembled structure according to a preferred embodiment of this invention.

15       FIG. 3 is a schematic circuit diagram of a preferred embodiment of this invention.

FIG. 4 is a diagram of a preferred embodiment of this invention.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

20       Please refer to FIGS. 1 and 2 for the intelligent power socket of this invention. In the figures, the power socket comprises a base 10, a casing 11 for covering the top of the base 10, at least a first socket 12 and a second socket 13 disposed on the casing 11, a printed circuit board (PCB) 20 disposed in the base 10 as shown in FIG. 3, an input end 201 disposed

on the printed circuit board 20 being coupled to an external power supply, and the input end 201 of the external power supply being connected with the first socket 12 and the second socket 13, and the output end of the external power supply being connected to a rectification circuit 21 by an electric circuit. The rectification circuit 21 further comprises a parallel capacitor C1 and a resistor R1 for lowering the voltage of an alternate current, and the capacitor C1 and the resistor R1 are coupled to a bridge rectifier (BD) 211, Zener Diodes ZD1, ZD2, and capacitors C2, C3 by an electric circuit, so that after the voltage of the alternate current is lowered, the alternate current will be converted into a pulse direct current of 12V by the bridge rectifier 211, Zener Diodes ZD1, ZD2 and capacitors C2, C3, and also will modify the pulse alternate current into a constant smooth direct current.

Further, the rectification circuit 21 is connected to a sampling amplify circuit 22, and the sampling amplify circuit 22 is connected to the first socket 12, and the sampling amplify circuit 22 has a transformer 221. The transformer 221 is connected to the first socket 12 and the rectification circuit 21, and the transformer 221 is also connected to a feedback amplify circuit which comprises an amplifier 222 and a plurality of resistors R2, R3, R4, and the output end of the feedback amplify circuit is connected to a diode D3, a capacitor C4, and a resistor R5 in series, so that when the power of the first socket 12 is connected, the amplified power is converted into a direct current.

Further, the sampling amplify circuit 22 is connected to a compare  
amplify circuit 22, and the compare amplify circuit 23 has a comparator  
231, and one input end of the comparator 231 is connected to the  
rectification circuit 21 through the capacitors C5, C6, resistor R6, and  
5 Zener diode ZD4, and another end is connected to the sampling amplify  
circuit 22, and the output end of the comparator 231 is connected to a  
resistor R7 in series, such that the comparator 231 will compare the  
voltage inputted from the sampling amplify circuit 22 with the standard  
voltage outputted from the rectification circuit 21.

10 In addition, the compare amplify circuit 23 is connected to a control  
circuit 24 by an electric circuit, and the rectification circuit 21 is connected  
to the second socket 13. The control circuit 24 has a relay 241, and the  
relay 241 is connected to a light emitting diode 242 and a transistor 242 in  
series, wherein the transistor 242 is connected to the output of the compare  
15 amplify circuit 23, so that after the compare amplify circuit 23 inputs the  
compared potential signal, the control circuit will connect or disconnect  
the relay 241 according to the inputted potential signal, and further turn on  
or off the power of the second socket 13. The light emitting diode 243  
will be lit to indicate the power ON status.

20 Please refer to FIG. 4 for the intelligent power socket of this invention  
while it is in use. This invention is applied to an electric appliance having  
audio and video effects, wherein the power socket of this invention is  
connected to an external power supply by an electric circuit, so that the

power can be supplied to the first socket 12 and the second socket 13, and then the power connector of the television 30 is plugged into the first socket 12 and related equipments 40 such as a videotape recorder and a stereo player are connected to the second socket 13. Therefore, if the power from the external power supply is inputted into the first socket 12 and the television is turned on, then the sampling amplify circuit 22 will convert the voltage of the alternate current inputted to the first socket 12 into the voltage of the direct current, and then send the voltage to the compare amplify circuit 23. The compare amplify circuit will compare the inputted voltage with a standard voltage, and then input a low potential signal to the control circuit 24, such that the relay is connected, and every equipment connected to the second socket 13 will be turned on accordingly. In the meantime, the light emitting diode 243 will be lit to indicate the power ON status. On the contrary, if the power of the television connected to the first socket 12 is turned off, the compare amplify circuit 23 will output a high potential signal to the control circuit 24, so that the relay 241 is disconnected, and the power of every equipment connected to the second socket 13 will be turned off accordingly. Such arrangement not only saves power, but also turns off the power of all electric equipments connected to the second socket 13 automatically when the power of the electric equipment connected to the first socket is turned off, and thus making the operation simple and easy.

In summation of the above description, the intelligent power socket of

the present invention herein enhances the shape, structure, device, and performance over the conventional structure and overcomes the shortcomings of the prior art. This invention also complies with the patent application requirements and thus is submitted to the Patent and Trademark Office for review and granting of the commensurate patent rights.

While the invention has been described by way of example and in terms of a preferred embodiment, it is to be understood that the invention is not limited thereto. To the contrary, it is intended to cover various modifications and similar arrangements and procedures, and the scope of the appended claims therefore should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements and procedures.